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ABSTRACT

To determine concept usage performance of the mentally handicapped when confronted with familiar items used in the concept usage tasks, 32 common concepts were presented to 25 educable mentally handicapped and 22 non-retarded subjects. From the responses to this number of referents task, a concept usage task was constructed which required choosing the three, of five, pictures that went together on a given card (one card per concept) as well as giving a verbal label for the concept. Results indicated that there were no significant differences between the groups on abstraction ability, on any of three measures from the number or referents task, or on the number of items correctly chosen in the concept usage task. It was noted that non-retarded subjects did, however, appropriately label significantly more of the concepts in the concept usage task. The report is volume 1, number 5 of Papers and Reports from Institute III: Exceptional Children and Adults, University of South Florida. (Author/CD)

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RETARDATE AND NON-RETARDATE CONCEPT USAGE PERFORMANCE: ABSTRACTION ABILITY, NUMBER OF REFERENTS AND ITEM FAMILIARITY

by
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Abstract

Thirty-two common concepts were presented to 25 EMR and 22 non-retarded subjects matched on MA and SES with instructions to "Name everything you can think of that is (concept name)." From the responses to this number of referents task, a concept usage task was constructed which required choosing the three (of five) pictures that went together on a given card (one card per concept) as well as giving a verbal label for the concept. Results indicated that there were no significant differences between the groups on abstraction ability, on any of three measures from the number of referents task, or on the number of items correctly chosen in the concept usage task. Non-retarded subjects did, however, appropriately label significantly more of the concepts in the concept usage task.

FOOTNOTES

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INTRODUCTION

The recent upsurge of interest in the conceptual development of retarded and non-retarded subjects reflects an awareness that conceptual ability is a precursor to learning and problem solving tasks. Studies of conceptual development have been of two general types. In studies of concept formation, concepts have been "trained into" the subject during the experimental session by rewarding correct responses (e.g., Braine, 1959; Heidbreder, 1946; Hull, 1920). In studies of concept usage, correct responses are not rewarded, but merely recorded. Studies of concept usage, of which the present investigation is one, attempt to tap the repertory of the subject, rather than alter that repertory (e.g., Blount, 1969b; Deese, 1965; Gerjuoy & Spitz, 1966; Piaget, 1952). The chief advantage of concept usage studies is the freedom of the subject to respond as he thinks he should. There is less danger of creating non-essential associations, concepts or modes of responding which may not only be foreign to the child's method of thinking, but actually interfere with his "typical" mode of responding.

The present author (Blount, 1968a), in a recent review of the concept usage literature involving retarded subjects, concluded that there was little evidence to support the notion that retardates had fewer concepts than non-retardates, but that

retardates did appear to be less able to use their concepts, particularly when verbal labels were required for that use. Previous research, however, has failed to demonstrate empirically that the retarded subjects involved in the samples were familiar with the items used in the concept usage tasks. Typically these items were drawn from a pool, established largely via experimenter preference, and it was assumed that all subjects would be familiar with these items (e.g., Clark & Thompson, 1963; Stephens, 1964). In some cases items have been equated on the basis of norms derived from non-retarded subjects (e.g., Evans, 1964). Thus, the finding by some studies that retardates were inferior to non-retardates on concept usage tasks might be due to unfamiliarity of the test stimuli on the part of the retarded subjects. This consideration is particularly important considering the generalized verbal deficit associated with lower intelligence (e.g., Blount, 1968b, 1969a; O'Connor & Hermelin, 1963).

One method of solving the above problem is to collect association data from the subjects on the items to be used in the concept usage task. Such a procedure was followed in the present study by employing a "number of referents task". It was believed that when item familiarity was controlled, that is,

when the situation was arranged so that the retardate could operate within his own conceptual frame of reference (using items known to be familiar to him), differences in concept usage ability would be reduced to non-significance at least in terms of the number of correct choices made in the concept usage task. However, due to the generalized verbal deficit associated with lower intelligence, it was felt that significant differences would appear for the ability to verbalize relationships even though a mental age (MA) match was used.

Aside from item familiarity, other factors might contribute to the findings which indicate less concept usage ability among retardates than non-retardates. Retardates may have fewer referents (examples) of a given concept in their respective repertories, and/or be somewhat poorer in general abstraction ability. The present contention was that retardates would be poorer on both variables.

METHOD

Subjects

From the available pool of subjects, 25 nonorganic educably mentally retarded (EMR) subjects in special education classes and 22 non-retardates in the second and third grades were unsystematically selected and matched on MA. All subjects

attended the same public school. Nine of the originally selected 56 subjects were lost due to absenteeism on test days. The non-retarded group had a mean MA of 90.77 months, with a standard deviation of 11.41 months, and a range of 74 to 111 months. Comparable figures for the retarded sample were 95.44, 10.63, and 72 to 110. IQ and MA scores were from the Binet, WISC (EMR), or Otis (non-retarded). The Warner scale (Warner, Meeker, & Eells, 1957) was modified and used for socio-economic status (SES) rating. Modification involved reversing the scale so that "7" was high and "1" was low, and adding a "0" category for housewives, parents on relief, welfare, or unemployed. As can be seen from Table 1, all subjects were of low SES status.

Concepts

The following 32 common concept names were used throughout the study: Curved, Sour, Deep, Cold, Pointed, Cut, Heavy, Wet, Sweet, Shiny, Clothes, Noisy, Furniture, Fruit, Plants, Tools, Sticky, Animals, Fly, Soft, Run, Made of (from) wood, Ride in (on), Make heat (burn), Drink from (out of, with), Eat with (used when you eat), Fight with, Cook with, Smoke with, Make light, Can eat, and Things you can put things in (things that hold other things).

Procedure

All subjects were seen individually a minimum of four times. Three tasks were administered: a number of referents task, Hammill and Irwin's (1966) abstraction ability test (administered and scored using the instructions provided), and a concept usage task. The first three sessions took place within a week of each other (number of referents task and abstraction ability test administered; order of test counterbalanced across subjects), and the final session took place approximately six weeks later (concept usage task).

Number of referents task: The concept names used in the number of referents task (pooled partly from O'Connor & Hermelin, 1963; Renz, 1965; and Underwood & Richardson, 1956) were given orally in a minimum of two sessions. Since there were no practice items, each subject began with a different concept name and an unsystematic order of presentation of concept names was followed. Subjects were instructed to "Name everything you can think of that is ___(concept name)___." No strict time pressure was enforced, but approximately two to three minutes were allowed for each concept name. Subjects were verbally encouraged to give as many responses as they could; e.g., "_____ and _____ and _____ are all ___(concept name)___. That is very good. Can you think

of more things that are __(concept name)__?" Responses were recorded verbatim.

Two separate alphabetical listings of all unique responses to each concept were made. One listing showed the frequency of each response, including both EMR and non-retarded frequencies, while another listing showed only the unique responses obtained. The second listing was presented to four raters. Raters were told only how the responses were obtained and that children did the responding. Raters were asked to judge each response as either being an example of the concept name which produced it, or not being an example of the concept. All responses eliminated by three or four of the raters were removed from both lists. The remaining responses were termed "appropriate". Inter-rater reliability was .951 using the analysis of variance technique outlined by Winer (1962, pp. 124-132).

Three scores for each subject were obtained from the number of referents task: the total number of responses given, the number of appropriate responses given, and the percent of appropriate responses.

In addition to two practice items, each card used in the concept usage task represented one of the concept names used in the number of referents task. Thus, 32 cards, each having five

five pictures, were presented singly to each subject and were shuffled between subjects. All stimuli were black-and-white line drawings presented on 5 x 8 inch white index cards, three pictures in the top half of the card and two in the bottom half. Three of each set of five pictures were related conceptually; the remaining two being superfluous to the conceptual grouping of the other three and having no apparent features in common. For each card (concept) three appropriate items were chosen so that each item had been given approximately an equal number of times by the EMR's and non-retardates on the number of referents task. Items were chosen for each concept so that one item had been given quite frequently, one item not so frequently, and one item rather infrequently. Items used as irrelevant for a particular concept had not been given as a response (appropriate or non-appropriate) to that concept.

For each card the experimenter first named each picture, verbally from left to right, top to bottom. Although not common to concept usage research, this naming procedure assured the experimenter that the subjects were receiving the exact response for the concept usage task that the experimenter had selected from the distribution of subject responses obtained from the number of referents task.

Subjects were then asked to point to the three pictures which went together. After a subject had made his choices, the experimenter covered all pictures (correct and incorrect) except the correct pictures chosen by the subject. The subject was then asked why the pictures went together.

The covering of all but the correct pictures chosen by the subject was to aid in conceptualization. Previous research could be criticized on the grounds that lower IQ subjects, due to their tendency to choose more incorrect items, were faced with the problem of trying to conceptually relate several items, some of which might have been incorrect for the concept the experimenter had in mind. The criticism is particularly valid when only the relationship the experimenter has in mind is counted as correct.

For each concept, the positions of the correct and incorrect items on the card were systematically varied by randomly assigning the concepts to the ten possible orderings of five things taken three at a time. A given correct or incorrect instance was then randomly assigned to the positions available for it. Reinforcement for the 32 cards consisted of "Good" or "Fine" regardless of subject performance. Responses were recorded verbatim.

Two scores for each subject were obtained from the concept usage task: the number of correct pictures chosen, and the number of acceptable verbalizations relating the pictures. For the latter score, any verbalization (other than a physical similarity of the drawings) which related the pictures the subject was observing was considered acceptable. This scoring procedure was decided upon so that subjects could demonstrate conceptual ability even if they did not produce exactly the concept name the experimenter had in mind. If a subject chose only one correct picture, he was asked, "What is __(name of correct picture)__ like?", his score for the number of correct pictures chosen was increased by one, and his number of acceptable verbalizations score remained unchanged. Three individuals made a collective decision regarding acceptability of verbalizations.

RESULTS AND DISCUSSION

In all, 9,970 responses were collected for the number of referents task (5,115 from the EMR's, and 4,855 from the non-retarded Ss), 9,209 of which were appropriate (4,735 from EMR's for 93% appropriate, and 4,474 from non-retardates for 92% appropriate). Additional results are summarized in Table 1.

t tests for equated groups revealed non-significant differences for all but one of the dependent variables (Table 1). The

TABLE 1

SUMMARY OF RESULTS[a]

Variable	Group	Mean	SD	Range	t
IQ	NR	90.00	15.71	70-124	8.2055
	EMR	65.00	4.58	55-71	$<.01$
CA in months	NR	101.82	9.08	87-120	18.9731
	EMR	148.16	16.14	115-172	$<.01$
SES	NR	1.91	1.19	0-4	.1826
	EMR	1.48	1.23	0-5	ns
Abstraction ability	NR	19.50	5.23	11-23	.2469
	EMR	19.60	2.99	13-23	ns
Total number of responses (NRT)	NR	220.27	52.27	136-337	.8860
	EMR	204.60	33.54	143-291	ns
Number of appropriate responses (NRT)	NR	203.36	51.99	112-313	.8562
	EMR	189.40	31.02	136-276	ns
Arcsin of percent appropriate (NRT)	NR	2.5918	.1717	2.0264-2.8371	.3548
	EMR	2.6072	.1364	2.3462-2.9741	ns
Number of correct choices (CUT)	NR	83.82	5.98	64-92	.7515
	EMR	82.56	5.43	73-91	ns
Number of acceptable verbalizations (CUT)	NR	19.91	6.29	12-30	2.1237
	EMR	15.96	6.77	5-29	$<.025$

[a]SES scale constructed so that "7" was high, "0" was low. Arcsin of percent conversion = "2 arcsin $\sqrt{X}$" (Winer, 1962, p. 650). "NRT" indicates data from Number of Referents Task. "CUT" indicates data from Concept Usage Task. Maximum value for the number of correct choices = 96; for the number of acceptable verbalizations = 32; and for Hammill & Irwin's abstraction ability test = 25; other tasks had no maximum values.

EMR's in special classes were significantly less able to verbalize relationships in the concept usage task than were the non-retarded subjects in regular classes. This occurred in spite of the fact that there were non-significant differences in abstraction ability, total number of responses to the number of referents task, number of appropriate responses to the number of referents task, percent of appropriate responses to the number of referents task, and particularly important, number of correct pictures chosen in the concept usage task.

It is significant to note that when one stays within the conceptual framework of the retardate (in this case by using items known to be familiar to him), the retardate can and does operate conceptually (at least in part) in a manner not significantly different from his MA peer.

The predicted differences in verbalization, which appeared in spite of the MA matching procedure and the familiarization control which eliminated (apparently) the differences in the other variables, lead to some interesting speculations. Evidently there is not a conceptual deficit per se either in terms of concept size or general abstraction ability, but rather a developmental lag on the part of the retardates: specifically where verbalization of relationships is concerned. Piaget

(e.g., Flavell, 1963) has noted that there is a point where children can operate in a conceptual fashion, but cannot verbalize the principle under which they are operating. Assuming that this point has been passed by the non-retardates (who could operate conceptually and verbalize) but not by the EMR's (who could operate conceptually but not verbalize), one may conclude that even though the over-all pattern of development may be similar for retardates and non-retardates, some of the developmental stages of that pattern develop differently for retardates and non-retardates. Apparently verbalization is developmentally out of phase for retardates.

Differences between the present results and those of other studies are attributed to the methodological considerations of the present study. Not the least of these was the effort to assure that all subjects were equally familiar with the test stimuli. The present results point out the value of collecting this kind of "multiple" word association norm, since word associations of the traditional "one-response" type would have been inadequate and inappropriate.

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